

Quantum Fingerprint-Based Air Quality Monitoring in Coastal Environments, Phase I

Completed Technology Project (2007 - 2008)



Project Introduction

Coastal environments vital to our nation are strongly impacted by natural and human factors and are also sensitive to global climate change. A need exists for innovative new field measurement technologies to support NASA's remote sensing efforts in coastal regions. Two specific subjects of interest include the air quality in coastal regions and algal blooms. We proposed to develop for commercialization a Quantum Fingerprint

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sensor based on a sapphire substrate that can be used for both even though they are not closely related. For air quality measurement in the coastal environment we will use the flexible QF

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technology to simultaneously detect, discriminate, and quantify levels of SO_x and NO_x. This flexibility, which arises from the unique set of energy levels created by the interaction of each species with the sensor, will also allow the same sensor to detect and monitor algal blooms by keying on their characteristic gaseous emissions. Thus, arrays of QF

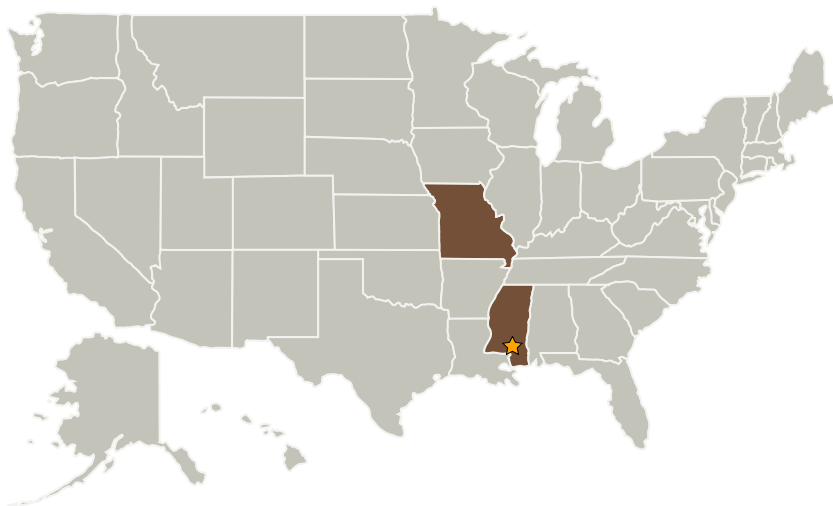
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sensors, both on and off shore, could simultaneously monitor coastal air quality and track algal blooms. Our goal is to assess how well two relatively different applications might be served by a single type of QF

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sensor when they occur in the same geographic area.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
US Semiconductor	Supporting Organization	Industry	Independence, Missouri

Primary U.S. Work Locations	
Mississippi	Missouri

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.4 Environmental Monitoring, Safety, and Emergency Response
 - └ TX06.4.1 Sensors: Air, Water, Microbial, and Acoustic